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October 5, 1974

Contract NAS 2-7698  
MONTHLY PROGRESS REPORT NO. 16  
September 1974

Fault Tectonics and Earthquake Hazards in the Peninsular  
Ranges, Southern California, EREP Investigation 463

NASA-Lyndon B. Johnson Space Center  
Technical Support Procurement Branch  
Houston, Texas 77058

Attention: F. D. Nolin

Gentlemen:

California Earth Science Corporation (CalESCO) is pleased to submit its 16th  
Monthly Progress Report on the application of Skylab imagery to analysis of  
fault tectonics and earthquake hazards in the Peninsular Ranges, Southern  
California under NASA Contract No. NAS 2-7698.

#### Summary Outlook

The principal plans for the immediate future are to continue analysis of images  
from SL1/SL2 and SL3. The milestone plan provides a time-oriented schedule of  
the entire effort to be performed.

#### Significant Progress

1. Additional data of the test site (Pass 43, Tract 16, SL 3) which was reviewed  
at the screening session at JSC in July, was received and enlarged prints  
were generated.
2. Work is progressing on processing the S0-192 interim tapes. A test image,  
uncorrected for geomorphic distortion, was generated from a portion of one  
tape.
3. A program for generating a test chart by computer was written and is being  
debugged.
4. An overflight of the planned S192 test site in the western Mojave Desert  
was made; excellent 35mm photos of the site were obtained.
5. Pseudocolor transformations, produced photographically, of the western

(E75-10022) FAULT TECTONICS AND  
EARTHQUAKE HAZARDS IN THE PENINSULAR  
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for any use made thereof."

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Mojave Desert and Coachella Valley were evaluated for their geologic content.

Expected Accomplishments, Current Month

1. Soil samples from the S192 site will be analyzed.
2. Work on two new technical reports describing significant results will be continued.
3. Information content of 190A, 190B and ERTS images of the Peninsular Ranges will be compared.

Travel Summary and Plans

The annual meeting of the Association of Engineering Geologists will be attended 17-18 October in Denver. Two papers describing significant results under Skylab and ERTS investigations will be presented if the abstracts are accepted. Copies of the abstracts are attached.

Very truly yours,

CALIFORNIA EARTH SCIENCE CORP.

*Donald L. Lamar*

Donald L. Lamar

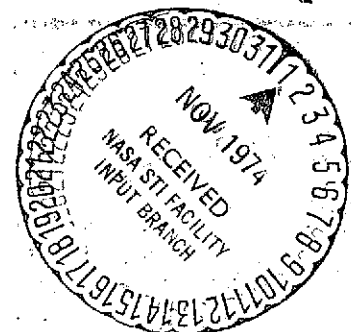
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FAULT INVESTIGATIONS IN THE PENINSULAR RANGES  
OF SOUTHERN CALIFORNIA UTILIZING ERTS AND SKYLAB IMAGERY

by

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ABSTRACT

ERTS and Skylab images reveal a number of prominent lineaments in the basement terrane of the Peninsular Ranges, Southern California. The major, well-known, active, northwest trending, right-slip faults are well displayed, but northeast and west to west-northwest trending lineaments are also present. Study of large-scale airphotos followed by field investigations have shown that several of these lineaments represent previously unmapped faults. Pitches of striations on shear surfaces of the northeast and west trending faults indicate oblique-slip movement; data are insufficient to determine the net-slip. These faults are restricted to the pre-Tertiary basement terrane and are truncated by the major northwest trending faults; therefore, they may have formed in response to an earlier stress system. Future work should be directed toward determining whether the northeast and west trending faults are related to the presently active stress system or to an older inactive system, because this question relates to the earthquake risk in the vicinity of these faults.

APPLICATION OF ERTS IMAGES TO STUDY OF ACTIVE  
AND POTENTIALLY ACTIVE FAULTS, SANTA BARBARA AREA,  
CALIFORNIA

by

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ABSTRACT

ERTS images were utilized in the preparation of the seismic safety element for Santa Barbara County. The following active faults constitute the principal seismic risk in Santa Barbara County: San Andreas, Big Pine, Santa Ynez, More Ranch, Santa Cruz Island and Santa Rosa Island. All of these faults can be recognized in the ERTS images and 70 per cent of their total lengths can be readily traced. Furthermore, major faults are commonly more easily traced on ERTS images than on larger scale (1:130,000) photos also utilized in this investigation. It is suggested that the eye tends to align individual fault segments over a greater distance because of the overview provided by ERTS imagery. Study of ERTS images can greatly increase the efficiency of fault investigations and should precede the study of larger scale imagery and detailed field investigations.